

AMENDED CLAIMS

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original claims 1-19 replaced by new claims 1-18 (4 pages)]

- 1.- Cooling for an electric motor or generator consisting of a housing, what is called a "slotless" tubular stator lamination (4), a rotor (2) with permanent magnets and electric windings (25-26) which are provided between the stator lamination (4) and the rotor (2), characterised in that the cooling comprises a cooler (6) upon which said windings (25-26) are provided and which is formed of a cooling element (7) which is provided between the stator lamination (4) and the rotor (2) and which cooling element (7) is provided with teeth (12) directed radially towards the rotor (2) which extend in the axial direction of the stator (1) and in between which axially directed grooves (13) are defined, such that the cooling element (7) has an external form of a conventional stator lamination with teeth for providing said windings (25-26).
- 2.- Improved cooling according to claim 1, characterised in that the above-mentioned teeth (12) and grooves (13) are evenly distributed over the inner perimeter of the cooler (6).
- 3.- improved cooling according to claim 1, characterised in that the above-mentioned windings (25-26) are provided around the above-mentioned teeth (12), whereby these windings (25-26) have axial parts (25) which extend in the above-mentioned grooves (13) and bent parts (26) which are bundled together into what is called a winding head (27) on both far ends of the stator (1).

4.- Improved cooling according to claim 1, characterised in that the cooler (6) is formed of a cooling element (7) with one or several passages (15) for a cooling fluid.

5.- Improved cooling according to claim 4, characterised in that the above-mentioned passages (15) are axially directed and are connected to an outlet collector (8) on one far end of the stator (1) and to an inlet collector (9) on the other far end of the stator (1) respectively.

6.- Improved cooling according to claim 4, characterised in that the above-mentioned cooling element (7) is formed of a double-walled tube with an outer tube (10) and an inner tube (11).

7.- Improved cooling according to claim 6, characterised in that the outer tube (10) is a cylindrical tube whose outer diameter corresponds to the inner diameter of the stator lamination (4), whereas the inner tube (11) is a corrugated tube with axially directed teeth (12) and grooves (13), whereby the outer and the inner tubes (10-11) are connected to each other by means of partitions (14) which, together with the outer and the inner tubes (10-11), define the above-mentioned passages (15) for the cooling fluid.

8.- Improved cooling according to claim 4, characterised in that the cooling element (7) is formed of axially directed pipes (29) which form the above-mentioned passages (15) and which are provided at mutually equal distances from each other between the stator lamination (4) and the rotor (2) and are cased at least with their far ends in two ring-shaped flanges (30) which are fixed in the stator lamination (4).

9.- Improved cooling stator according to claim 8, characterised in that at least a part of the above-mentioned pipes (29) are situated partially between the axial parts (25) of the above-mentioned windings (25-26).

10.- Improved cooling according to claim 8, characterised in that the above-mentioned ring-shaped flanges (30) are provided with teeth (33) which are radially directed towards the rotor, in between which the above-mentioned windings (25) are provided.

11.- Improved cooling according to claim 10, characterised in that the space between the pipes (29) and the axial parts (25) of the windings (25-26) is at least partially filled with a thermally conductive and electrically insulating filling material (35).

12.- Improved cooling according to claim 4, characterised in that the above-mentioned outlet and inlet collectors (8-9) are each formed of a ring-shaped element which confines a ring-shaped chamber (37), whereby this ring-shaped element is connected to a side wall (19) against a far end of the cooling element (7) and whereby this side wall (19) has been worked open at the above-mentioned passages (15) of the cooling element (7).

13.- Improved cooling according to claim 12, characterised in that each above-mentioned ring-shaped element is connected to the above-mentioned housing (3) with an outer wall (16) and in that at least one opening (20-21) is provided in this outer wall (16), which opening is situated

opposite to an outlet opening (21), inlet opening (23) respectively, in the housing (3).

14.- Improved cooling according to claim 13, characterised in that in the above-mentioned ring-shaped element in the wall (17) directed towards the rotor (2) is provided a recess (36) in which the winding head (27) is cased on the far end concerned of the stator (1).

15.- Improved cooling according to claim 4, characterised in that the above-mentioned outlet and inlet collectors (8-9) are formed of a ring-shaped chamber (37) which is confined by the housing (3); of the cooling element (7); of an inner tube (38) which is provided concentrically in the cooling element (7); and of a ring-shaped lid (39) which is connected to the housing (3) and to the above-mentioned inner tube (38).

16.- Improved cooling according to claim 15, characterised in that in the housing (3), at the height of the outlet and inlet collectors (8-9), is provided at least one outlet (21) or inlet opening (23) respectively.

17.- Improved cooling according to claim 1, characterised in that the cooler (6) is made of a thermally conductive and electrically insulating material.

18.- Improved cooling according to claim 1, characterised in that the cooler (6) forms a separation between the cooling fluid and the electric windings (25-26).